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45. An optical beam steering apparatus comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and

J

a beam steering assembly having a steerable element positioned at a predetermined orientation within the upper cavity for controllably altering the optical path of an impinging beam in at least one direction that is emanating from or propagating towards the primary optical path.

CW

46. An optical beam steering apparatus comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body,

J

a waveguide for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and

CW

a beam steering assembly having a steerable element positioned substantially adjacent the upper cavity for controllable directing the light beam.

47. An optical beam steering apparatus comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body,

J

a groove for accommodating the passage of the light beam aligned in a predetermined orientation with the upper cavity, and

CW

a beam steering assembly having a steerable element positioned substantially adjacent the upper cavity for controllable directing the light beam.

J2

51. An optical beam steering apparatus comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and

SJ

K2

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a beam steering assembly having a steerable element positioned substantially adjacent the upper cavity for controllably directing the light beam.

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52. An optical beam steering apparatus comprising:
a single substrate body defined by an upper surface and formed with an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and
a beam steering assembly having a steerable element positioned substantially adjacent the upper cavity for controllably directing the light beam.

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Cant
53. An optical beam steering apparatus comprising:
a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity,

a beam steering assembly having a steerable element hingedly secured to said substrate body adjacent the upper cavity for controllably directing the light beam from the steerable element generally toward a lower surface of the single substrate body, and

a cover plate for covering at least said one cavity and an adjacent surface of the substrate body.

54. An optical beam steering apparatus comprising:
a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity,

a beam steering assembly having a steerable element positioned substantially adjacent the upper cavity for controllably directing the light beam from the steerable element generally toward a lower surface of the single substrate body, and

a cover plate is formed from fused silica for covering at least said one cavity and an adjacent surface of the substrate body.

F2

55. An optical beam steering apparatus comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and

a hinge for flexibly connecting the beam steering assembly with an upper edge of the upper cavity that is not coincident with the primary optical path;

wherein the beam steering assembly includes at least one reflective surface such that the beam steering assembly is disposed within the upper cavity so that an impinging beam of light emanating from the primary optical path is controllably deflected in the same general direction the upper cavity is facing and wherein a beam of light entering from the same general direction the upper cavity is facing is controllably deflected towards said primary optical path.

SJ

70. An optical head assembly comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and

a beam steering assembly rigidly affixed in a predetermined orientation within at least a portion of the upper cavity having a steerable element hingedly secured to said substrate body substantially adjacent the upper cavity for controllably directing the light beam through at least a portion of the upper cavity.

71. An optical head assembly comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and

beam steering assembly rigidly affixed in a predetermined orientation within the upper cavity by chemical bonding with a chemical bonding agent, and

having a steerable element positioned substantially adjacent the upper cavity for controllably directing the light beam through at least a portion of the upper cavity.